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ILLINOIS COMMERCE COMMISSION

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DR. QIN LIU

POLICY DEPARTMENT

TELECOMMUNICATIONS DIVISION

STAFF EX. 2.0

JANUARY 21, 2004

1 **Q. Please state you name and business address.**

2 A. My name is Qin Liu, and my business address is 160 N. La Salle Street,
3 Suite C-800, Chicago, Illinois 60601.

4
5 **Q. Please describe your educational background.**

6 A. I earned a BA in Mathematics in the People's Republic of China, and a
7 PhD degree in economics from Northwestern University (Evanston) prior
8 to joining the policy department of the Telecommunications Division at the
9 Illinois Commerce Commission.

10
11 **Q Have you previously testified before the Commission?**

12 A. Yes. I have testified before this Commission in various proceedings,
13 including ICC Dockets 00-0700, 01-0515, 01-0786, 01-0662, and 02-0560.

14
15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to review testimonies by SBC witness
17 and competing carriers' witness regarding loop trigger analysis, and to
18 assess whether SBC has made reasonable efforts to collect information,
19 and to assess whether parties have appropriately interpreted and applied
20 the applicable FCC rules and regulations regarding loop non-impairment
21 trigger analysis.

22

23 **Part I: Introduction**

24 **Q. Please describe the purpose of your testimony.**

25 A. The purpose of my testimony is to respond to SBC witness J. Gary
26 Smith's non-impairment trigger analyses for high capacity and dark fiber
27 loops,¹ and the interveners' responses to Mr. Smith's analyses.²
28 Specifically, I will discuss whether Mr. Smith has appropriately applied the
29 FCC prescribed standards for non-impairment trigger tests. I will also
30 discuss whether the competitive LEC witnesses have interpreted the FCC
31 non-impairment trigger appropriately.

32
33 **Q. What is a local loop?**

34 A. A local loop, in its simplest form, is the transmission path between a
35 central office and the customer's premises. It is the last "mile" of the
36 carrier's network that enables the customer to receive telecommunications
37 services.

38
39 **Q. What is a high capacity loop?**

40 A. A high capacity loop generally refers to a digital local loop that has a
41 capacity level (or total digital signal speed) of 1.544 mbps or above. A
42 DS1 loop is a digital loop having a capacity of 1.544 mbps, equivalent to
43 twenty-four DS0 or voice grade equivalent loops. A DS3 loop is a digital

¹ SBC Ex. 2.0.

² Joint CLEC Ex. 1.0, AT&T Ex. 1.0,

44 loop having a capacity of 44.736 Mbps, equivalent to twenty-eight DS1
45 level loops. An OC3 loop has the capacity of three DS3 loops, an OC12
46 loop has the capacity of twelve DS3 loops and so on.³

47 Note that DS1 loops can be provided over either copper or fiber
48 facilities. DS3 loops are generally provided over fiber facilities. OCn loop
49 circuits are provided over fiber facilities. OCn circuits operate and
50 interface at capacities ranging from OC3 to OC192. When DS1/DS3
51 loops are provided over fiber facilities, the DS1/DS3 loop circuits are
52 generally not physically separate facilities, but rather channelized circuits
53 (or bandwidth capacities) within the larger OCn loop circuit (e.g., OC3).
54 For example, three DS3 loop circuits can be provided over an OC3 fiber
55 system through use of electronic equipment (such as multiplexers and de-
56 multiplexers).⁴

57 Moreover, loops of different capacity terminate at different
58 interfaces. An OC3 circuit terminates on an OC3 interface, while DS3
59 circuits terminate on a DS3 interface, though an OC3 has the same
60 capacity as three DS3.

61

62 **Q. What is a dark fiber loop and why does it exist in a fiber optic**
63 **network?**

³ In a SONET-based network, transmission speed is classified using OCn. "OC" stands for "Optical Carrier". OCn circuits range from OC3 to OC192, i.e., the smallest common OCn capacity is OC3.

⁴ When provisioning DS1 loop circuits over an OC3 fiber system, OC3 DS1 drop cards (along with associated equipments) are required. Similarly, when provisioning DS3 loop circuits over an OC3 system, OC3 DS3 drop cards (along with associated equipments) are required.

64 A. Dark fibers are *unused* fiber strands within an existing fiber optic cable to
65 which no opto-electronics (optronics) have been attached. Once the
66 necessary optronics are attached, the dark fibers become "lit" (or
67 activated) and are capable of transmitting signals. By itself, a dark fiber
68 has virtually unlimited capacity, and the underlying capacity level of a
69 strand of dark fiber is only defined by the optronics attached to it. A dark
70 fiber loop is simply the dark fiber that runs between a central office and the
71 customer location.

72 Note that the ultimate purpose of deploying dark fiber is to activate
73 the fiber for the provisioning of OCn circuits. Dark fiber exists in a carrier's
74 network as unused fiber because the carrier normally places fiber strands
75 (or fiber cable sizes) in excess of what the carrier *immediately* needs to
76 activate to serve a particular customer location. The primary costs of fiber
77 placement are the sunk costs associated with physically laying fiber – cost
78 of Right-Of-Way (ROW), digging up the streets and trenching fiber cable,
79 etc.; and the total costs of fiber placement vary little with the number of
80 fiber strands (*i.e.*, cable size) placed. For example, the *per-foot*
81 incremental cost of fiber placement is \$1 when increasing the fiber cable
82 size from 72 to 144 fiber strands.⁵ Carriers thus normally place more fiber
83 strands (or larger cable sizes) than they *immediately need* to avoid the
84 future high duplicate costs to retrench the same location should demand
85 for additional fiber arise. Thus, the economic costs of excess fiber strands

⁵ Triennial Review Order, ¶312, n. 918.

at the time of initial fiber placement would be far exceeded by the potential economic gains from eliminating the need for additional fiber placement in the future. Accordingly, the existence of dark fiber (*i.e.*, unused or idle fiber) is the logical result of a carrier's long run optimal investment strategy.

Part II: FCC Triennial Review Order

Q. What findings did the FCC make in its Triennial Review Order regarding high capacity loops of OC3 level or above?

A. In its *Triennial Review Order* ("TRO"), the FCC concluded:

[R]equesting carriers are not impaired on a nationwide basis without access to unbundled 'lit' OCn loops because the barriers to the deployment of OCn "lit" loops can be overcome through self-deployment at the OC3 and above level, the use of unbundled dark fiber, or the use of "lit" DS3s.⁶

That is, the FCC made a non-impairment finding for OCn loops and consequently, incumbent LECs are no longer required by federal laws to unbundle their high capacity loops at OC3 level or above.

Q. What findings has the FCC made in its Triennial Review Order regarding dark fiber loops?

A. Unlike high capacity loops at OC3 level and above, the FCC in its TRO made a provisional finding of impairment regarding dark fiber loops:

⁶ Triennial Review Order, ¶315.

111 We find on a national basis that requesting carriers are
112 impaired at most customer locations without access to dark
113 fiber loops.⁷
114

115 The FCC, however, recognizes that, while competing carriers have no
116 alternative to the incumbent LEC's fiber facilities in most areas, competing
117 LECs have been able to self-deploy fiber facilities to *some* customer
118 locations though the evidence on record is not sufficient to identify these
119 specific customer locations. The FCC authorized state commissions to
120 conduct a granular analysis on a customer-location-specific basis to
121 identify those customer locations where competitive carriers are not
122 impaired without access to the ILEC's unbundled dark fiber loops.⁸
123

124 **Q. What findings has the FCC made in its Triennial Review Order**
125 **regarding DS3 loops?**

126 A. Similar to the case of dark fiber loops, the FCC has made a provisional
127 finding of impairment at the national level for DS3 loops and it has also
128 imposed a cap on the incumbent LEC's obligations to unbundle DS3
129 loops:

130 We make a national finding that requesting carriers are
131 impaired on a customer-location-specific basis without
132 access to unbundled DS3 loops.⁹
133
134 ...
135

⁷ Triennial Review Order, ¶311.

⁸ Triennial Review Order, ¶¶312-314.

⁹ Id., ¶320.

136 [W]e limit an incumbent LEC's unbundling obligation to a
137 total of two DS3s per requesting carrier to any single
138 customer location.¹⁰
139

140 That is, the FCC made a non-impairment finding for high capacity loops
141 above two DS3 level and an impairment finding for high capacity loops at
142 or below this level (*i.e.*, two DS3). These findings are consistent with the
143 FCC's non-impairment finding for OC3 loops because an OC3 loop has
144 the same capacity as three DS3 loops.

145 DS3 loop deployment involves placing fiber and attaching
146 optronics. Like dark fiber loops, DS3 loop deployment involves significant
147 fixed and sunk costs associated with physically placing fiber (digging
148 streets and trenching fiber cable), ROW, and building access etc.^{11,12}
149 These fixed and sunk costs impose significant entry barriers, particularly
150 for single-DS3-loop deployment, as the revenue generated by a single
151 DS3 loop is generally not sufficient to justify the deployment. Some
152 competitive carriers, however, have been able to deploy multiple DS3
153 loops to particular customer locations.¹³ Further, some wholesale
154 alternatives have also emerged at some particular customer locations.¹⁴

155 The FCC, however, found that it did not possess sufficient evidence

¹⁰ Id., ¶324.

¹¹ A DS3 loop can be deployed by attaching opto-electronics (optronics) to pre-existing dark fiber loop (if such a dark fiber loop preexists). Alternatively, a DS3 loop can be deployed as an extension to an existing fiber ring – that is, by placing a lateral to extend the (fiber) building ring or Local Serving Office (LSO) ring to the building location and attaching optronics.

¹² The electronics (or optronics) attached to dark fiber are not considered sunk costs as they can be moved to another location when the carrier ceases to provide services to this location.

¹³ Triennial Review Order, ¶321.

¹⁴ Id.

necessary to identify those particular customer locations where competing carriers would not be impaired without access to incumbent LEC's unbundled DS3 loops.¹⁵ The FCC thus authorized the state commissions to conduct a granular analysis on a location-by-location basis to identify those particular customer locations where competing carriers would not be impaired without access to incumbent LEC's unbundled DS3 loops.¹⁶

Q. What findings has the FCC made in its Triennial Review Order regarding DS1 loops?

A. Similar to the case of DS3 loops, the FCC made a provisional finding of impairment regarding DS1 transport:

We find that requesting carriers generally are impaired without access to unbundled DS1 loops.¹⁷

Similar to dark fiber and DS3 loop deployment, DS1 loop deployment involves significant fixed and sunk costs. In contrast to higher capacity (such as DS3 or OCn) loops, DS1 loop facilities are typically used to serve small and medium-sized business customers, and therefore generate much lower revenue potentials than loops serving large enterprise customers. Further, small and medium-sized business customers generally tend to shy away from long-term contract obligations. Taken together, lower revenue-generating capability, greater *churn rate* and

¹⁵ Id.
¹⁶ Id.
¹⁷ Triennial Review Order, ¶325.

178 significant sunk deployment costs render it economically infeasible or
179 unviable for competitive carriers to self-deploy DS1 loops.^{18 19}

180 In contrast to the case of DS3 loops, there is little evidence of an
181 emerging or potentially growing wholesale market for *alternative* DS1
182 loops.²⁰ The FCC, however, noted that there might be some customer
183 locations where 'competitive carriers have deployed fiber and could offer
184 excess capacity at DS1 loop level.'²¹ That is, wholesale market of
185 alternative DS1 loops may exist at some particular customer locations,
186 though the FCC does not have sufficient evidence on record necessary to
187 identify those particular customer locations.²² The FCC thus authorized
188 the state commissions to conduct a granular analysis on a location-by-
189 location basis to identify those particular customer locations where
190 wholesale market for alternative DS1 loops exists and where competing
191 carriers would not be impaired without access to incumbent LEC's
192 unbundled DS1 loops.²³

193

194 **Q. Please describe the standards that the FCC established in its TRO**
195 **for identifying those particular customer locations where competing**

¹⁸ The "churn" rate refers to the rate at which customers change service providers.

¹⁹ Triennial Review Order, ¶¶324-326.

²⁰ "Alternative" DS1 loops refer to DS1 loops deployed by carriers other than incumbent LECs.

²¹ Triennial Review Order, ¶¶327.

²² Id.

²³ Id.

196 carriers would not be impaired without access to the incumbent
197 LEC's unbundled dark fiber, DS3 and DS1 loops.

198 A. The FCC established three alternative methods to non-impairment
199 customer:(1) self-provisioning trigger, (2) competitive wholesale trigger,
200 and (3) potential deployment.²⁴

201 A particular customer location meets the self-provisioning trigger if
202 two or more *unaffiliated* competing carriers have deployed their own loop
203 facilities and are currently serving customers over these self-deployed
204 facilities at this location.²⁵ The self-provisioning trigger applies to DS3 and
205 dark fiber loops.²⁶

206 A particular customer location meets the competitive wholesale
207 facilities trigger if two or more *unaffiliated* competitive carriers have
208 deployed loop facilities to this location and are currently offering these
209 loop facilities on a wholesale basis to competing carriers seeking to serve
210 customers at this location.²⁷ This trigger applies to DS1 and DS3 loops.²⁸

211 If a particular customer location meets either trigger, competing
212 carriers would not be impaired without access to the incumbent LEC's
213 unbundled loop facilities at the location and the incumbent LEC's
214 unbundling obligation under the federal law would be accordingly

²⁴ See, generally, 47 C.F.R. §51.319(a)(4),(a)(5), (a)(6)

²⁵ 47 C.F.R. §51.319(a)(5)(i)(A); (a)(6)(i).

²⁶ *Id.*

²⁷ 47 C.F.R. §51.319(a)(4)(i-ii); (a)(5)(i)(B)(1-2).

²⁸ *Id.*

eliminated.²⁹ If a particular customer location fails both triggers, state commissions are then required to apply the potential deployment method or standard to this location for purpose of non-impairment determination. See Staff Witness Genio Staranczak for discussions on Loop Potential Deployment.

Q. Are both triggers applicable to each of the three loop types: dark fiber, DS3 and DS1?

A. No. Under the FCC rule and regulation, both triggers are applicable to DS3 loops, but exceptions and special considerations are made for dark fiber and DS1 loops.

As noted above, significant fixed and sunk deployment costs, low revenue opportunities, and high churn rate taken together render self-deployment of DS1 loops economically unviable. Thus the FCC authorized the state commissions to apply only the competitive wholesale trigger to DS1 loops. That is, *the self-provisioning trigger is not applied to DS1 loops.*

Dark fiber loops are not typically offered or provided at retail like lit fiber loops. It is necessary to modify the self-provisioning trigger when applying to dark fiber loops. For this reason, the FCC modified its self-provisioning trigger as it related to dark fiber loops:

²⁹ 47 C.F.R. §51.319(a)(4)(i); (a)(5)(i); (a)(6)(i).

[T]he merely existence of two unaffiliated competitive providers (in addition to the incumbent LEC) that have deployed fiber to that location, whether or not they are offering dark fiber to other carriers to serve end-user customers at that locations, will satisfy the Self-Provisioning Trigger for dark fiber loops and require a finding of no impairment at that location.³⁰

Unlike DS3 loops, to satisfy the self-provisioning trigger, the competing dark fiber provider does not have to provide dark fiber loops at retail to the customers at the location. As modified such, the self-provisioning trigger would necessarily overlap with the competitive wholesale trigger. The FCC thus authorized the state commissions to apply only the self-provisioning trigger to dark fiber loops. That is, *the wholesale trigger is not applied to dark fiber loops.*

Q. How should the state commissions treat dark fiber facilities obtained on an indefeasible-right-of-use (IRU) basis for purpose of self-provisioning determination?

A. The FCC Rule and Regulation states:

For purpose of this determination [self-provisioning trigger], a competing provider that has obtained those dark fiber facilities under a long-term indefeasible right of use shall be considered a competing provider with its own dark fiber facilities. Dark fiber purchased on an unbundled basis from the incumbent LEC shall not be considered under this paragraph [self-provisioning trigger].³¹ (*Illustration added*)

³⁰ Triennial Review Order, ¶334.

³¹ 47 C.F.R. § 51.319(a)(6)(i).

264 That is, when a competitive carrier has obtained dark fiber facilities on a
265 long-term IRU basis, these *IRU* fiber facilities shall count toward meeting
266 the dark fiber self-provisioning trigger. In short, self-deployed dark fiber is
267 equivalent to IRU dark fiber for purpose of meeting the self-provisioning
268 trigger. This applies to *IRU dark fiber* obtained from competitive fiber
269 providers as well as *IRU dark fiber* obtained from ILECs.³² A particular
270 customer location may satisfy the dark fiber self-provisioning trigger even
271 if no competitive provider has actually deployed fiber facilities at this
272 location, and for example, the dark fiber self-provisioning trigger would be
273 met if two competitive providers have obtained *IRU* dark fiber from the
274 incumbent LEC.

275 The equivalency to self-deployed (*i.e.*, own) dark fiber is only
276 limited to *IRU* dark fiber, not extended to dark fiber *obtained* on other
277 terms. The *unbundled* dark fiber facilities obtained from the incumbent
278 LEC, for example, would not count toward meeting the dark fiber self-
279 provisioning trigger.³³

280
281 **Q. How should the state commissions treat DS3 loop facilities that a**
282 **competitive carrier has deployed by attaching its own optronics to**
283 **dark fiber facilities *obtained* for purpose of self-provisioning trigger**
284 **determination?**

³²
³³ The FCC sets forth its rationale for this decision at *Triennial Review Order*, ¶333, n. 981.
Triennial Review Order, ¶333

285 A. Under the FCC rules promulgated pursuant to the *Triennial Review Order*,
286 dark fiber facilities obtained on an IRU basis (*i.e.*, IRU fiber facilities) count
287 toward satisfying the DS3 self-provisioning trigger.³⁴ More precisely, the
288 DS3 loop facilities that a competitive carrier has deployed by attaching its
289 own optronics to dark fiber facilities obtained on an IRU basis (*IRU* dark
290 fiber) shall count toward meeting the DS3 self-provisioning trigger.³⁵ In
291 short, DS3 loops that have been deployed by attaching optronics to *IRU*
292 dark fiber are equivalent to DS3 loops that have been deployed by
293 attaching optronics to *self-deployed* (*i.e.*, own) dark fiber for purpose of
294 self-provisioning trigger determination.³⁶

295 The *equivalence* between “self-deployed” (*i.e.*, own) and “IRU” for
296 purpose of DS3 self-provisioning trigger determination is limited only to
297 dark fiber facilities, not extended to *lit* fiber facilities. An *IRU* DS3 loop —
298 *i.e.*, a ‘lit’ fiber transmission path at DS3 level *obtained* on an IRU basis
299 from a competitive provider or the incumbent LEC — would not count
300 toward meeting the DS3 self-provisioning trigger.

301 In contrast to *IRU dark fiber*, dark fiber obtained on terms other
302 than IRU would not be treated equivalent to self-deployed (or own) dark
303 fiber for purpose of DS3 self-provisioning trigger determination. A DS3
304 loop that a competing provider has deployed by attaching its own
305 optronics to the *unbundled* dark fiber obtained from the incumbent LEC,

34 47 C.F.R. §51.319(a)(5)(i)(A)

35 Id.

36 Id.

306 for example, would not count toward meeting the DS3 self-provisioning
307 trigger.³⁷

308

309 **Q. How should the state commissions treat DS1/DS3 loop facilities that**
310 **a competitive carrier has deployed by attaching its own optronics to**
311 **dark fiber facilities *obtained* for purpose of wholesale trigger**
312 **determination?**

313 **A.** The competitive wholesale trigger is applicable to both DS1 and DS3
314 loops.³⁸ Similar to the case of self-provisioning trigger (DS3 & dark fiber),
315 IRU dark fiber is considered equivalent to self-deployed (or own) dark fiber
316 for purpose of wholesale trigger determination.³⁹ The competing
317 (wholesale) provider's DS1/DS3 loops that are deployed by attaching its
318 own optronics to the IRU dark fiber counts toward meeting the wholesale
319 trigger.⁴⁰ In addition, the (wholesale) provider's DS1/DS3 loops that are
320 deployed by attaching optronics to the dark fiber facilities that have been
321 obtained from other fiber providers on terms other than long-term IRU also
322 count toward satisfying the wholesale trigger.⁴¹ In short, the equivalency
323 to self-deployed (own) dark fiber has been extended from IRU dark fiber to
324 any dark fiber obtained on an unbundled, leased or purchased basis for
325 purpose of wholesale trigger determination. A particular customer location

37 47 C.F.R. §51.319(a)(6)(i)
38 47 C.F.R. §51.319(a)(4)(ii); (a)(5)(i)(B)
39 47 C.F.R. §51.319(a)(4)(ii)(A)
40 47 C.F.R. §51.319(a)(4)(ii)(A); (a)(5)(i)(B)(1)
41 Id.

326 may meet the wholesale trigger even if no competing providers have
327 deployed own dark fiber or obtained IRU dark fiber, and the wholesale
328 trigger, for example, would be met if two competing (wholesale) providers
329 have attached their own optronics to *unbundled* dark fiber obtained from
330 the incumbent LEC.⁴²

331

332 **Q. Please briefly summarize the requirements on the qualifying dark**
333 **fiber under self-provisioning and wholesale triggers.**

334 **A.** Under the self-provisioning trigger, the dark fiber used to provision high
335 capacity loops at the relevant capacity (*i.e.*, dark fiber or DS3) can be
336 either self-deployed (*i.e.*, own) or IRU dark fiber (*i.e.*, dark fiber obtained
337 on a long-term IRU basis).⁴³ Under the competitive wholesale trigger,
338 however, the dark fiber used to provision DS1/DS3 loops can be self-
339 deployed (*i.e.*, own), IRU dark fiber, or any dark fiber obtained on an
340 unbundled, purchased or leased basis.⁴⁴ In short, the dark fiber
341 requirement under the wholesale trigger is much less restrictive than
342 under the self-provisioning trigger.

343 Moreover, the electronics used to activate dark fiber for the
344 provision of DS1/DS3 loops must be the competing provider's *own*
345 equipment under both triggers.⁴⁵

346

⁴²

Id.

⁴³

47 C.F.R. §51.319(a)(5)(i)(B)(1); (a)(6)(i)

⁴⁴

47 C.F.R. §51.319(a)(4)(ii)(A); (a)(5)(i)(B)(1)

⁴⁵

47 C.F.R. §51.319(a)(4)(ii)(A); (a)(5)(i)(B)(1); (a)(6)(i)

Part III: SBC Trigger Analysis

Q. Please summarize SBC' non-impairment filing under the self-provisioning and wholesale triggers.

A. SBC is seeking a non-impairment finding for 122 end user customer locations under the loop self-provisioning trigger for DS3 and dark fiber loops, respectively.⁴⁶ SBC also is seeking non-impairment finding for the same list of 122 customer locations under the competitive wholesale trigger for DS1, DS3 and dark fiber loops, respectively.

Q. Please describe how SBC identify the 122 customer locations for which SBC is seeking non-impairment finding under the self-provisioning loop trigger for DS3 and dark fiber loops.

A. As noted earlier in this testimony, the dark fiber that a competing carrier has obtained under a long-term Indefeasible Right to Use basis ("IRU dark fiber") shall be considered the same as the dark fiber that a competing carrier has self-deployed under the self-provisioning trigger. That is, IRU dark fiber is equivalent to self-deployed dark fiber for purposes of meeting the self-provisioning trigger. Dark fiber obtained on an unbundled basis ("unbundled dark fiber"), however, would not count towards meeting the self-provisioning trigger.

SBC first identifies customer locations to which fiber loop facilities have been deployed and which are currently served by at least two

⁴⁶ See SBC Illinois Ex 2.0, Confidential Attachment JGS-8 & JGS 9

369 competing carriers. SBC also identified the competing carriers that
370 currently provide services for each of the 122 locations identified.

371

372 **Q. What sources of information does SBC rely on in identifying the 122**
373 **customer locations to which, SBC believes, fiber loop facilities have**
374 **been deployed and which are served by at least two competing**
375 **carriers?**

376 **A.** Unlike an UNE proceeding in which SBC is the primary party that
377 possesses the information required for the Commission to make its
378 determination, the information required to assess the self-provisioning or
379 the competitive wholesale trigger – *i.e.*, information on competing carriers'
380 network deployment and service offerings -- is largely in the possession of
381 the competing carriers. SBC, on the other hand, does not possess the
382 exact information. Thus, to show non-impairment at any customer
383 locations, SBC has to rely on external sources of information. The two
384 external sources of information or data that SBC relies on to identify the
385 customer locations for which it is seeking a non-impairment finding under
386 the self-provisioning trigger are: GeoResults and discovery requests.

387

388 **Q. Please explain how SBC, based on information obtained from**
389 **GeoResults, identifies its customer locations for which it is seeking a**
390 **non-impairment finding.**

391 A. GeoResults is a database marketing and consulting firm. One database it
392 has developed or collected is information on fiber "lit" buildings (*i.e.*,
393 buildings to which *lit* fiber facilities have been deployed). GeoResults
394 database contains a listing of fiber terminating equipment (such as
395 multiplexers and demultiplexers), which is connected to fiber transmission
396 facilities, and the associated owners of the fiber terminating equipment.⁴⁷
397 Note that under the FCC rules established in its TRO, to meet the self-
398 provisioning trigger *a competing carrier must have deployed its fiber loop*
399 *facilities by attaching its own optronics -- i.e., fiber loop terminating*
400 *equipment -- though it may use self-deployed dark fiber or dark fiber*
401 *obtained on an IRU basis. That is, a qualifying competing carrier under*
402 *the self-provisioning trigger must own the fiber loop terminating equipment*
403 *(i.e., optronics). SBC, based on GeoResults database, identifies the*
404 *qualifying customer locations by identifying the customer locations where*
405 *at least two competing carriers own working fiber terminating equipment.*
406

407 **Q. Is SBC able to identify the type of fiber terminating equipment**
408 **GeoResults database? That is, is SBC able to identify the loop**
409 **capacity (DS1, or DS3) from the fiber terminating equipment records**
410 **contained in the GeoResults database?**

411 A. It does not seem to be so. Otherwise, SBC would not have attempted to
412 verify if a carrier has deployed and is provisioning DS3 loops at a

⁴⁷ SBC Illinois Ex. 2.0 at 18

413 particular location based competing carriers' response to SBC discovery
414 and based on information from public sources such as advertising.⁴⁸
415

416 **Q. Technically speaking, a competing carrier may attach its own fiber**
417 **terminating equipment (i.e., optronics) to dark fiber it obtained from**
418 **SBC on an unbundled basis (i.e., unbundled dark fiber). How can**
419 **SBC tell whether the owner of fiber terminating equipment identified**
420 **in GeoResults database did not attaching its own optronics to**
421 **unbundled dark fiber?**

422 **A.** Under the FCC rules established in the TRO, fiber loops that have been
423 deployed by attaching own optronics to unbundled dark fiber would not
424 count towards meeting the self-provisioning trigger. Thus those (if any)
425 fiber terminating equipment owners identified in GeoResults database who
426 have deployed loop facilities by attaching its own fiber terminating
427 equipment to unbundled dark fiber should be dismissed as unqualified
428 competing carriers for purpose of assessing self-provisioning trigger.
429 Based on SBC record, however, there are no purchases of unbundled
430 dark fiber loops in the Chicago area.⁴⁹ Thus SBC concludes that all the
431 fiber terminating equipment owners identified in the GeoResults database
432 attach their own optronics to competing carrier's loop transmission
433 facilities, not to the unbundled dark fiber loops obtained from SBC.

⁴⁸ SBC Illinois Exhibit 2.0 at 22-23.

⁴⁹ Id. at 22.

434

435 **Q. Is the information from the GeoRedults database confirmed by**
436 **responses to SBC's discovery requests?**

437 A. Based on SBC testimony, 96 of the 122 customer locations, for which
438 SBC is seeking a non-impairment finding, have been confirmed by
439 competing carriers' response to SBC discovery request. SBC is working
440 with the relevant carriers to obtain the necessary information to verify the
441 remaining 28 customer locations.⁵⁰

442

443 **Q. How does SBC verify whether competing carriers are offering or**
444 **providing DS3 or dark fiber loop facilities at a particular customer**
445 **location?**

446 A. As noted before, high capacity loops can be provisioned over fiber
447 facilities at various capacities: DS1, DS3, and OCn. SBC appears to
448 identify whether a competing carrier provisions DS3 loop at a particular
449 customer location through a combinations of public information, and
450 responses to SBC discovery request.⁵¹ SBC also identifies the qualifying
451 customer locations based on the logic that fiber facilities are capable of
452 any transmission speed.⁵² That is, SBC simply assumes that the
453 competing carries provision DS3 loops as long as they have deployed
454 fiber loops.

⁵⁰ SBC Illinois Ex. 2.0 at 22.

⁵¹ SBC Illinois Ex. 2.0 at 22-23.

⁵² SBC Illinois Ex. 2.0 at 17.

455

456 **Q. Is SBC assumes that a competing carrier that has deployed fiber**
457 **loop facilities generally has dark fiber loop facilities.⁵³ Is this**
458 **assumption reasonable?**

459 **A.** Generally, yes. As noted before, when deploying fiber loop facilities, a
460 carrier generally deploy or place fiber facilities in excess of what it would
461 immediately need to serve its customers. This makes economic sense, as
462 deployment of loop facilities is associated with significant fixed and sunk
463 costs, which is the key reason behind the FCC's impairment finding for
464 DS1, DS3 and dark fiber loop facilities. Therefore, *the existence dark fiber*
465 *loop facilities are a reasonable assumption wherever lit fiber loop facilities*
466 *have been deployed.* That is, wherever a carrier deploys fiber facilities it
467 would generally place more fiber than it immediately needs to activate to
468 serve customers and thus would have dark fiber. Therefore, I recommend
469 that the Commission presume that dark fiber exists where a competing
470 carrier has placed fiber loop facilities unless proven otherwise with
471 factually based concrete evidence.

472

473

474 **Q. What about carriers that have obtained dark fiber on a long term**
475 **Indefeasible right to use (IRU) basis?**

⁵³ SBC Illinois Ex. 2.0 at 23.

476 A. At the present I tentatively take the position that the Commission should
477 treat IRU dark fiber in the same way as self-deployed dark fiber. That is,
478 the Commission should assume that any carrier that has obtained IRU
479 dark fiber has dark fiber or spare dark fiber unless proven otherwise with
480 factually based concrete evidence. I base my tentative conclusion on the
481 fact that IRU dark fiber is generally obtained on a long-term basis (e.g., 20
482 years). When leasing dark fiber on a long-term basis, the carrier
483 would (try to) lease fiber to meet its long-term demand. Thus it is
484 reasonable to assume that the carrier would lease IRU dark fiber
485 in excess of what it immediately needs to provide services. Therefore, I
486 tentatively conclude that "IRU dark fiber exhaustion" (*i.e.*, no spare IRU
487 dark fiber) is more an exception than the general rule unless and until I
488 come into possession of factually based concrete evidence to convince
489 me that "spare dark IRU fiber exhaustion" is not the exception but the
490 general rule.

491 Of course, I acknowledge that there may potentially exist some
492 exceptional circumstance in which a carrier that has obtained IRU dark
493 fiber but has used up (or activated) all of its IRU dark fiber ("IRU dark fiber
494 exhaustion"), but it, if it exists at all, would be an exception than the
495 general rule. I therefore recommend that the Commission require that a
496 competing carrier claiming IRU dark fiber exhaustion at a particular
497 customer location come before the Commission with factually based
498 concrete evidence and if convinced, the Commission can disqualify this

499 carrier as a dark fiber provider. This type of ruling should be made on a
500 case-by-case basis.

501

502 **Q. Do you recommend that the Commission make a provisional finding**
503 **of non-impairment for dark fiber loops at these 122 locations?**

504

505 A. Yes. I recommend that the Commission make a provisional finding of
506 non-impairment for dark fiber loop facilities at the 122 customer locations
507 identified by SBC. Should a carrier come before this Commission with
508 factually based concrete evidence to prove otherwise, the Commission
509 may amend its decisions or provisional finding on a location-by-location
510 basis.

511

512 **Q. Are you shifting the "burden of proof" from SBC to competing**
513 **carriers?**

514 A. No. Unlike other proceedings (such as UNE proceeding), in which SBC is
515 the primary possessor of information that is required for the Commission
516 to make its determination, all parties in this proceeding should bear
517 "burden of proof" to some extent. In other words, the parties that possess
518 the required information should bear some "burden of proof." The
519 Commission has to adopt an approach that would entice both SBC and
520 competing carriers to collect and present information. This is a reasonable
521 and balanced approach for the following reasons. First, if the Commission

522 decides to put the entire "burden of proof" on SBC who is not the primary
523 possessor of information required in this proceeding, it would give
524 competing carriers more incentives not to provide information which is in
525 its possession when requested, not mentioning collecting information for
526 the Commission to make its determination. Second, should the
527 Commission decide to put the entire "burden" of proof on the competing
528 carriers who are the primary possessors of the required information, SBC,
529 the beneficiary of a non-impairment finding would not have any incentives
530 to collect and present information either. Thus it is reasonable for the
531 Commission to adopt a balanced approach that entices both sides to
532 collect information. SBC so far has taken a "first shot" at data collection,
533 and competing carriers have criticized and questioned the quality of SBC's
534 data or database. Instead of merely criticizing the quality of SBC data,
535 competing carriers should make efforts to collect better information.
536 Otherwise their criticism of the quality of SBC data rings hollow.

537
538 **Q. Do you believe that the Commission should also make finding of**
539 **non-impairment on the 122 end-users customer locations for DS3**
540 **loop facilities?**

541 **A.** Not at this moment. The Commission needs a better record of information
542 before it makes its determination. First, the Commission needs to make
543 assessment on SBC's assumption that fiber loop facilities are capable of
544 any transmission speeds. That is, if a competing carrier provisions fiber

loop facilities, then this carrier should also be considered as DS3 loop facilities provider. Second, the Commission should require that SBC to provide more detailed information about its filing. Specifically, based on what SBC has filed⁵⁴ one can hardly tell at which location which carrier is actually provisioning DS3 loops, or at which location which carrier is assumed to be provisioning DS3 loops, based on the logic that fiber loop facilities are capable of any transmission speeds, including, but not limited to DS3. In short, SBC should provide a detailed set of information such that the Commission is be able to verify whether a competing carrier at a particular location is currently provisioning DS3 loops, is assumed to be provisioning DS3, or is considered to be a DS3 loop provider via public sources of information such as web sites, press releases and advertising. This detailed information would enable the Commission to make an assessment of the reasonableness of SBC's methods in identifying the qualifying competing carriers.

Q. Do you have additional comments?

A. Yes. Different parties in this proceeding may have differing interpretations of the applicable FCC rules and regulations established in the TRO. A simple question like "Has your company deployed DS3 loops to this location?" may not be sufficient to elicit consistent responses because a party's response or answer is largely affected by that party's

⁵⁴ See, e.g., SBC Ex. 2.0, Attachment JGS-9

understanding or interpretation of the applicable FCC rules and regulation. Therefore, the Commission should require participating parties (competitive LECs participating in this proceeding) to provide information on any loop deployment (including, but not limited to, simply placing or attaching optronics) in the 122 locations identified by SBC, regardless whether the party believes that its "loop deployment" qualifies as loop deployment under either the self-provisioning trigger or the competitive wholesale trigger.

Part IV: Responses to Competing Carriers' Testimony

Q. Sprint witness James Burt stated, "SBC incorrectly assumes that any provider of lit fiber facilities will automatically be a provider of dark fiber. The presence of lit fibers in any one section of fiber cable does not force a conclusion that spare fiber exists."⁵⁵ Do you have comments?

A. As noted earlier, a carrier generally places fiber in excess of its immediate needs and thus places spare fibers. Wherever fiber loops have been deployed, there would be *unused fiber (i.e., dark fiber)*. Unlike copper loop exhaustion, dark fiber exhaustion has not generally been a problem where it has been deployed. As SBC is not the primary possessor of information required under the self-provisioning or the competitive wholesale trigger, SBC does not have exact information on each location.

⁵⁵ Sprint Ex. 2.0 at 15.

589 In my opinion, SBC's assumption is a reasonable one as a starting point.
590 Of course, if an exception occurs at some specific location (specially at
591 some of the 122 locations identified by SBC), it needs to be brought
592 before the Commission in this proceeding. If Mr. Burt has any factually
593 based, concrete information about fiber exhaustion (*i.e.*, no spare fiber) at
594 any section of the loops that serve any of the 122 locations, or if Mr. Burt
595 has factually based, concrete information about fiber loop exhaustion with
596 a particular lit fiber loop provider serving some particular locations of the
597 122 location identified by SBC, Mr. Burt should present this information to
598 the Commission, which the Commission may use as grounds for a finding
599 of impairment. SBC's list of 122 locations should serve as a starting point.
600 Competing carriers participating in this proceeding should provide factually
601 based, concrete information about loop deployment to these locations —
602 but not simply argue what might potentially occur.

603

604 **Q. In criticizing SBC's loop self-provisioning trigger analysis, Joint**
605 **CLEC witness Gary Ball stated, " SBC incorrectly included buildings**
606 **for which one or more of the CLECs identified does not have *full***
607 ***access to all of the customers in the building. If some or most of***
608 ***the customers in a building are not capable of being served by a***
609 ***competitive provider, that building obviously should not be listed as***
610 ***being served by the competitive provider for purpose s of the self-***

611 provisioning trigger.”⁵⁶ Does loop self-provision trigger require “full
612 access to all of the customers in the building”?

613 A. No. Under the loop wholesale trigger, the FCC rules and regulations
614 established in the TRO specifically require that the wholesale provider
615 have to have “full access to all of the customers in the building.”⁵⁷
616 However, there is no such specific language for the loop self-provisioning
617 trigger. In my opinion, it is only reasonable to interpret the difference to
618 mean that the FCC did not require that each qualifying self-provisioning
619 carrier have to have “full access to all of the customers in the building.”
620 That is, Mr. Ball’s “full access” interpretation of the FCC rules and
621 regulations governing the loop self-provisioning trigger is inappropriate.

622

623 Q. Mr. Ball also argued that buildings identified solely based on
624 GeoResults should not be included in the list of qualifying
625 locations.⁵⁸ Do you agree?

626 A. Yes. I agree that these buildings that were identified based only on
627 GeoResults should not be considered as eligible locations unless
628 confirmed by the applicable competing carrier. For these locations,
629 investigation should continue.

630

⁵⁶ Joint CLEC Exhibit 1.0 at 15-16.
⁵⁷ 47 F.R.C. §51.316(a)(5)(i)(B).
⁵⁸ Joint CLEC Ex. 1.0 at 17.

631 Q. Mr. Ball also suggested that carriers that did not specify capacity
632 levels at locations where they provide services using self-
633 provisioned loop facilities (carriers such as Yipes, Abovenet and
634 Level 3) should be excluded from the qualifying competing providers
635 under the self-provisioning trigger.⁵⁹ Do you agree?

636 A. No. First, even if these carriers only provision OCn loops, they should not
637 be dismissed out of hand. As noted before, an OCn loop has the capacity
638 of multiple DS3 loops and DS1 loops. The Commission needs to decide if
639 OCn loops should count toward meeting the DS3 self-provisioning trigger.
640 I thus recommend that the Commission not dismiss OCn loop facilities
641 from its self-provisioning assessment of DS3 loops.

642

643 Q. Mr. Ball, in criticizing the accuracy of GeoResults, stated "buildings
644 identified may actually be served by SBC's own facilities." Do you
645 have comments?

646 A. I do not know how Mr. Ball came to conclude that this is a possibility.
647 When technically this is possible, SBC-provided evidence seems to have
648 ruled out this possibility. Based on information provided by Mr. Smith,⁶⁰ it
649 is unlikely that lit fiber loop facilities, as identified by GeoResults⁶¹, have
650 been deployed by SBC using fiber loop facilities (and a CLEC fiber
651 termination equipment). Of course, should Mr. Ball present factually

⁵⁹ Id. at 16.

⁶⁰ SBC Ex. 2.0 at 20-21

⁶¹ SBC Ex. 2.0, Confidential Attachment GJS-9

652 based concrete information on this subject, I will reconsider my position on
653 this subject.

654

655 **Q. Mr. Ball, in interpreting the qualifying high capacity loop under the**
656 **competitive wholesale trigger, stated: "[T]he high-capacity loop in**
657 **question must provide a connection into SBC's central office.**
658 **Competitors must be able to connect a wholesale loop with another**
659 **carrier's transport, with their own collocated facilities, or with SBC**
660 **UNE transport."**⁶² **Do you agree?**

661 **A.** No. The FCC rules governing the competitive wholesale trigger do not
662 contain such conditions as those suggested by Mr. Ball. In my opinion,
663 Mr. Ball's interpretation amounts to adding restrictions to the competitive
664 wholesale trigger analysis.

665

666 **Q. Mr. Ball, in interpreting the qualifying loops, also stated: "[E]ach loop**
667 **must terminate at a location that affords alternative providers access**
668 **to the entire customer premises – including, in multi-tenant**
669 **buildings, access to the same common space, house, and rise, and**
670 **other intra-building wire as SBC enjoys."**⁶³ **Do you have comments?**

671 **A.** Yes. If by this passage, Mr. Ball meant that a qualifying wholesale
672 provider must be able to have access to the entire building (i.e., access to

⁶² Joint CLEC Ex. 1.0 at 26.
⁶³ Id. at 26.

673 each customer at the location), I agree with Mr. Ball. However, if Mr. Ball
674 meant that a qualifying wholesale provider must have identical access as
675 SBC – i.e., access to the same common place, the same house, the same
676 risers and the same other intra-building wire – then I disagree. Nowhere
677 in the FCC rules governing the self-provisioning trigger are such
678 conditions to be found.

679 I note that at some locations, “full access” may mean having
680 identical access as “SBC enjoys.” But it may not be so in every instance.
681 Mr. Ball’s interpretation rules out any other possible scenarios in which the
682 wholesale provider has full access to the whole building but not access to
683 the same common space, the same house, the same riser, and the same
684 intra-building as SBC enjoys. Thus, in my opinion Mr. Ball’s interpretation
685 is inappropriate.

686

687 **Q. Mr. Ball also argued that, to have reasonable access to the wholesale**
688 **provider, “SBC must provide requesting carriers with adequate**
689 **cross-connect termination at cost based rates.”⁶⁴ Do you have**
690 **comments?**

691 **A.** If, by “cost based rates”, Mr. Ball means TELRIC-based UNE rates, I am
692 reluctant to agree. I am unaware of any such specific language in the
693 rules related to the competitive wholesale trigger that requires this to be
694 the case.

⁶⁴ Id. at 27.

695

696 **Q. Mr. Ball states, "SBC simply made an assumption that any existing**
697 **fiber facility can provide DS1-level service. This assumption is**
698 **wrong."⁶⁵ Do you have comments?**

699 A. I agree that the existence of fiber facilities does not necessarily mean the
700 wholesale provider is currently offering DS1 or DS3 at wholesale though it
701 may potentially be able to do so.

702

703 **Q. Please summarize your recommendation.**

704 A. First, I recommend that the Commission presume that competing carriers
705 that have deployed fiber loop facilities also have dark fiber. As a result,
706 the Commission should make a provisional finding of non-impairment at
707 the 122 customer locations unless factually based concrete evidence
708 proves otherwise. This provisional non-impairment finding for dark fiber
709 loops is support by evidence of record. Based on SBC records, it has not
710 sold any unbundled dark fiber loops in the Chicago MSA⁶⁶ and thus it is
711 reasonable to draw a tentative conclusion that competing carriers would
712 not be impaired without access to unbundled dark fiber loop from SBC.

713 Second, I recommend that the Commission not dismiss OCn loop
714 facilities out of hand when assessing the DS3 self-provisioning trigger, as
715 Mr. Ball urges. Instead, the Commission should consider for itself whether

⁶⁵

Id. at 31.

⁶⁶

SBC Illinois Ex. 2.0 at 21.

716 OCN loop facilities should count toward meeting the DS3 self-provisioning
717 trigger.

718 Third, I recommend that the Commission require that SBC provide
719 a more detailed set of information about its non-impairment filing.
720 Specifically, SBC should provide sufficiently detailed information so that
721 the Commission will be able to identify the particular customer locations at
722 which a particular competing carrier is actually provisioning DS3 loop
723 facilities, at which a particular competing carrier is assumed to provision
724 DS3 loop facilities based on the logic that fiber loop facilities are capable
725 of any transmission speeds, or at which a particular competing carrier is
726 "verified" as a DS3 loop provider through SBC discovery or through public
727 sources of information such as web sites and advertising. That is, the
728 Commission should be able to identify different categories of DS3 loop
729 "deployment": (1) actual, (2) assumed, (3) "verified" by discovery or public
730 sources information.

731 Third, the Commission should also require that competing carriers
732 that are parties to this proceeding to come forward to present information
733 in their procession on the loop deployment at these 122 customer
734 locations (at DS1, DS3 and OCN level), instead of merely criticizing the
735 quality of SBC data or information.

736

737 **Q. Does this conclude your testimony?**

738 **A. Yes.**

Errata
Direct Testimony – Dr. Qin Liu - Loops
Staff Ex. 2.0

Page 1, lines 16 and 17 – On both lines, the word “witness” should be changed to witnesses”

Page 7, line 166 – The word “loops” should be substituted for “transport”.

Page 11, line 246 – The word “modified” should be stricken.

Page 19, line 423 – The words “a CLEC’s” should be inserted between “attaching” and “own”.

Page 19, line 429 – The word “record” should be changed to “records”.

Page 20, line 439 - The word “request” should be changed to “requests”.

Page 20, line 449 - The word “combinations” should be changed to “combination”.

Page 20, line 450 - The word “request” should be changed to “requests”.

Page 21, line 460 – The phrase “deploy or place” should be replaced by “deploys or places”.

Page 21, line 469 – The word “presume” should replace the misspelling “pesume”.

Page 24, line 525 – The word “their” should replace “its”.

Page 24, line 543 –The phrase “assessment on” should read “an assessment of”.

Page 25, line 546 – The word “that” should be deleted.

Page 25, line 253 – The word “is” should be replaced by “will”.

Page 33, line 731 – The word “third” should be replaced by “fourth”.

Rebuttal Testimony – Dr. Qin Liu - Loops
Staff Ex. 6.0

Page 2, line 35 – The number “9” should be changed to “7”.

Page 2, line 37 – The number “9” should be changed to “7”.

Page 2, line 39 – The numbers “43” and “55” should be removed.

Page 2, line 41 – The number “9” should be changed to “7”.

Page 2, line 41 – The number “8” should be changed to “6”.

Page 3, line 45 – The number “8” should be changed to “6”.

Page 9, line 189 – The word “AT&T’s” should be changed to “AT&T”.

Page 10, line 206 – The word “the” between “of” and “SBC’s” should be deleted.

Page 12, line 236 – The phrase “go to length” should be replaced by “go to great lengths”.